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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/196,185	11/20/1998	MYUNG-KOO HUR	6192.0052.AA	8847

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EXAMINER	
QI, ZHI QIANG	
ART UNIT	**PAPER NUMBER**
2871	

DATE MAILED: 04/05/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/196,185	HUR ET AL.	
	Examiner	Art Unit	
	Mike Qi	2871	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *17 February 2004 and 15 January 2004*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-3,6-14 and 18-26* is/are pending in the application.

4a) Of the above claim(s) *1-3,6-13 and 18-20* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *14 and 21-26* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on Feb.17, 2004 has been entered.

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. Claims 14, 21-26 are rejected under 35 U.S.C. 103(a) as being unpatentable over US 5,852,481 (Hwang) in view of US 5,162,933 (Kakuda et al) and JP 05241173 (Yatabe et al).

Claims 14, 23-24 and 26, Hwang discloses (col.1, line 36 – col.5, line 15; Fig.1) that a conventional liquid crystal display comprising:

- an insulating substrate (glass substrate 10);
- a gate wire (11, 12) formed on the substrate (10), and the gate wire must have gate line, gate electrode and gate pad, and the gate wire having two layers 11 and 12);

- a gate insulating layer (15) covering the gate wire (11,12);
- a semiconductor layer (17) formed on the gate insulating layer (15);
- a data wire (18, 19) connected the source/drain electrodes, and formed on the semiconductor layer (17), and the data wire must have data line, data electrode and data pad, and the source/drain electrodes having two layers (18, 19);
- a passivation layer (21) formed on the data wire and the gate wire, and having one contact hole extended to the gate pad and another contact hole extended to the drain electrode;
- a transparent conductive layer (indium tin oxide, ITO, pixel electrode 22) formed on the passivation layer (21), and connected to the gate pad and the data wire (source/drain electrodes) through contact holes.

Hwang does not expressly disclose that the material for the two layer structure of the gate wire and data wire as the main layer and the supplementary layer as claimed.

However, Kakuda discloses (col.10, line 30 – col.11, line 55; Fig.8) that the gate line (13) and the data line (11), both of them, are formed by laminating metal layers (13a, 13b; 11a, 11b) such as MoCrx and aluminum layers, and such laminating metal layers prevents the generation of hillock and its surface remained smooth, and the thin film transistors formed on such a layer remarkably decreasing the number of shorts.

Concerning the metal material for the main layer and the supplementary layer, Yatabe discloses (abstract) that the material of the electrode for liquid crystal display comprising metal nitride that is a solvent-resistant or air permeation resistant, so that is

substantially inert to an etchant used for etching the transparent layer and preventing the gate pad and the data wire from being eroded by the etchant; and because the metal nitride material has such property, such that the electrode enables high quality display by forming such metal nitride layer.

Therefore, it would have been obvious to those skilled in the art at the time the invention was made to arrange both of the gate wire and data wire as two layer structure (metal as main layer, and metal nitride as supplementary layer) as claimed in claims 14, 23-24 and 26 for achieving inert etching such as solvent-resistant/air permeation-resistant and a high quality display.

Claims 21-22, Hwang discloses ((col.1, line 36 – col.5, line 15; Fig.1) that a conventional liquid crystal display wherein a transparent conductive layer (indium tin oxide, ITO, pixel electrode 22) formed on the passivation layer (21), and connected to the drain electrode (19) through a contact hole; and using ITO as a gate ITO connected to the gate pad (such as gate pad 12) though another contact hole, and using same ITO material to form the pixel electrode and the gate ITO layer would simplify the manufacturing process, and that would have been at least obvious.

Claim 25, Concerning the material such as tungsten (W) of the supplementary layer for the gate wire and data wire, Kakuda also discloses (col.7, lines 8 – 29) that using tungsten (W) to form the gate lines (11) and the data lines (13), and tungsten also is a refractory metal and having higher workability by chemical wet etching. Therefore, it would have been obvious to those skilled in the art to use tungsten as the material for

the supplementary layer of the gate wire and data wire as claimed in claim 25 to achieving a higher workability by chemical wet etching.

Response to Arguments

3. Applicant's arguments with respect to claims 14,21-26 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

4. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

5. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Mike Qi whose telephone number is (571) 272-2299. The examiner can normally be reached on M-T 8:00 am-5:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Robert Kim can be reached on (571) 272-2293. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Mike Qi
March 25, 2004

TARIFUR R. CHOWDHURY
PRIMARY EXAMINER